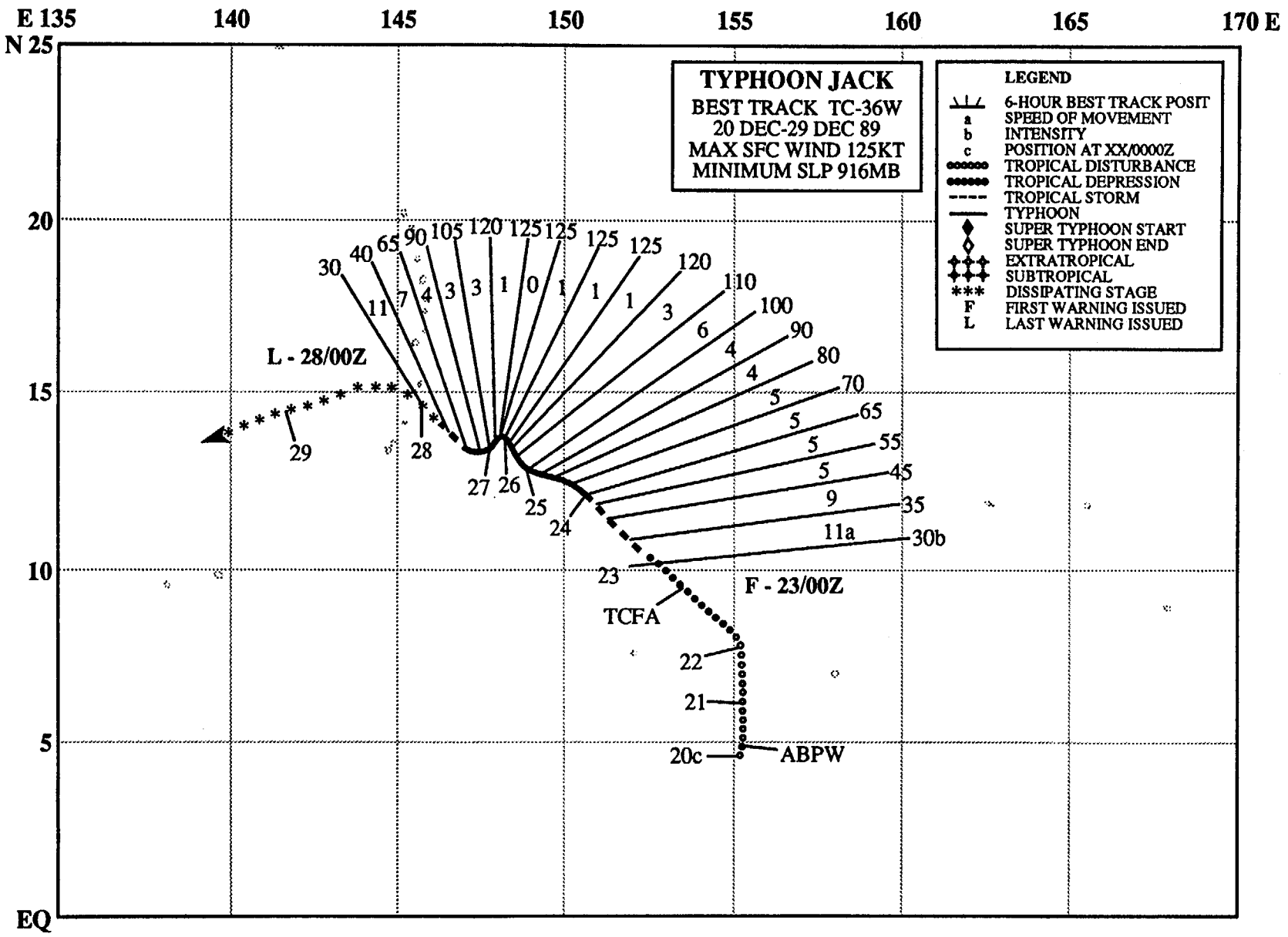
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EQ
TYPHOON JACK
BEST TRACK TC-36W
20 DEC-29 DEC 89
MAX SFC WIND 125KT
MINIMUM SLP 916MB
LEGEND
6-HOUR BEST TRACK POSIT
a SPEED OF MOVEMENT
b INTENSITY
c POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
SUBTROPICAL
*** DISSIPATING STAGE
F FIRST WARNING ISSUED
L LAST WARNING ISSUED
L - 28/00Z
F - 23/00Z
TCFA
ABPW
29
28
27
26
25
24
23
22
21
20c
30
40
65
90
105
120
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TYPHOON JACK (36W)

The second tropical cyclone to form in December, Jack was the twenty-first typhoon and final tropical cyclone of the year. Typhoon Jack was noteworthy for the unusually long period it remained quasi-stationary and the extremely rapid dissipation that followed.

A broad area of poorly organized convection located approximately 240 nm (445 km) southeast of Truk was first noted on the 210600Z Significant Tropical Weather Advisory. The disturbed area of weather continued to organize slowly and a Tropical Cyclone Formation Alert was issued at 221900Z. At that time, the disturbance was 150 nm (275 km) northeast of Truk, moving west-northwestward at 8 kt (15 km/hr) with surface winds of 20 to 30 kt (10 to 15 m/sec). Over the next 8 hours, the upper-level anticyclonic circulation and the spiral bands of the disturbance increased significantly in organization, however, the low-level circulation remained weak. The combination of the rather tentative intensification of the disturbance and its movement in the general direction of Guam prompted the issuance of a Tropical Depression Warning at 230000Z. At that time Tropical Depression 36W was approximately 400 nm (740 km) southeast of Guam and forecast to move northwestward at 11 kt (20 km/hr).

The low-level organization of Tropical Depression 36W appeared to improve markedly on satellite imagery resulting in the issuance of a Tropical Cyclone Warning at 230600Z. The motion forecast for the next four days called for continued northwestward movement toward a weakness in the subtropical ridge near Guam, followed by recurvature due to an approaching short-wave trough. The system did reach a weak area at the axis of the subtropical ridge in about two days. However, the broad nature of the ridge blocked Jack's movement in all directions. This caused the cyclone to stall in a

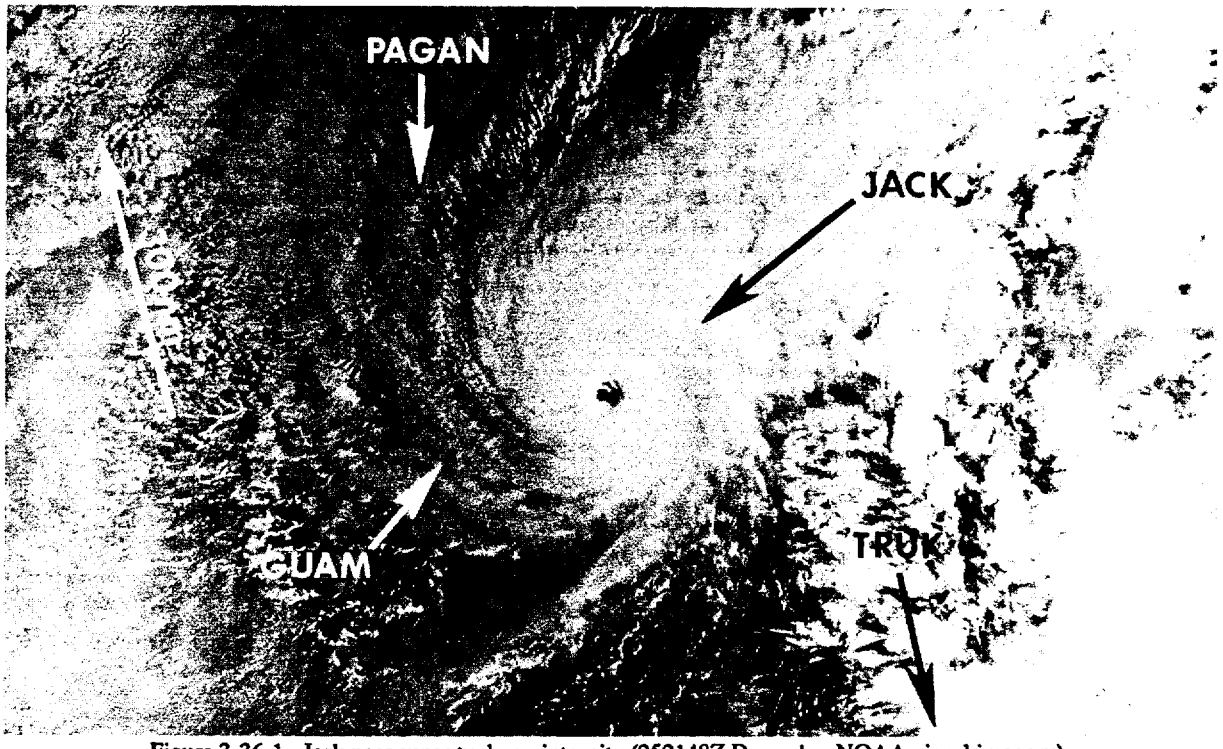

Figure 3-36-1. Jack near super typhoon intensity (252148Z December NOAA visual imagery).

large area of weak mid-level steering at a latitude too far south to permit the passing short-wave trough to initiate recur-vature. Jack had closed to within 185 nm (345 km) of Guam before stalling. The proximity to Guam allowed surveillance to be conducted by the weather radar at Andersen AFB (WMO 91218). In what is almost certainly a record for almost no motion, radar surveillance doc-umented that Jack moved only about 60 nm (110 km) from 250710Z to 270335Z, and moved less than 20 nm (35 km) from 251210Z to 261210Z. Jack's eye, with a diameter of 20 to 30 nm (37 km to 55 km), made an ideal target for remote sensing. The typhoon was essentially stationary in a non-shearing environment for nearly 48 hours.

Not surprisingly, the unusual motion of Typhoon Jack was accompanied by an equally unusual intensification and dissipation pattern. From a maximum wind speed of 30 kt (15 m/sec) at 222330Z, Jack rapidly deepened to a maximum wind speed of 115 kt (57 m/sec) at 250530Z, which corresponds to nearly two T-numbers per day using the Dvorak intensity estimation technique. It reached a peak intensity of 125 kt (67 m/sec; Dvorak T6.5) during the period 251800Z to 261200Z (Figure 3-36-1). Such an intensification pattern was unusual since Jack appeared to have only one well-defined outflow channel to the northeast. Normally, rapid deepening and the attainment of super-typhoon intensity are associated with the development of two efficient outflow channels.

As Jack began to show signs of prolonged quasi-stationary behavior, JTWC anticipated on the 260000Z warning that the upwelling of cold water at the cyclone's center, normally associated with the wind stress on the ocean's surface, might initiate a rapid weakening of the system due to its slow movement. Although

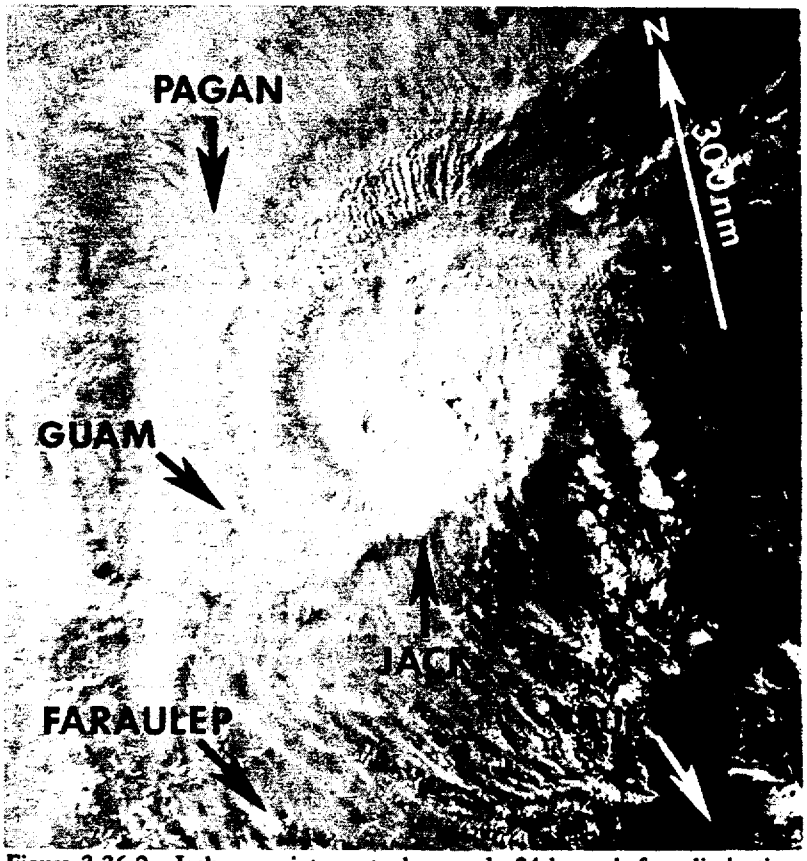

Figure 3-36-2. Jack as an intense typhoon only 24 hours before dissipation (262126Z December NOAA visual imagery).

such weakening did indeed occur, the extreme nature of the ensuing dissipation was surprising. At 270000Z, JTWC assessed the intensity of Jack (Figure 3-36-2) to be about 105 kt (54 m/sec). Figure 3-36-3 shows the remnants of Jack 24 hours later. All that remained was a 30-kt (15-m/sec) exposed low-level circulation located 120 nm (220 km) northeast of Guam. This remarkable weakening rate exceeded 15 kt (8 m/sec) per 6 hour forecast period. The remnants of the associated convective cloud mass were about 300 nm (555 km) to the south of the low-level circulation center. The vorticity associated with the cloud mass actually developed a secondary low-level circulation center that moved south of Guam on 28 December. Of interest, NOAA imagery on 29 December detected a cold water cyclonic eddy in the ocean where Jack had been quasi-stationary for nearly two days.

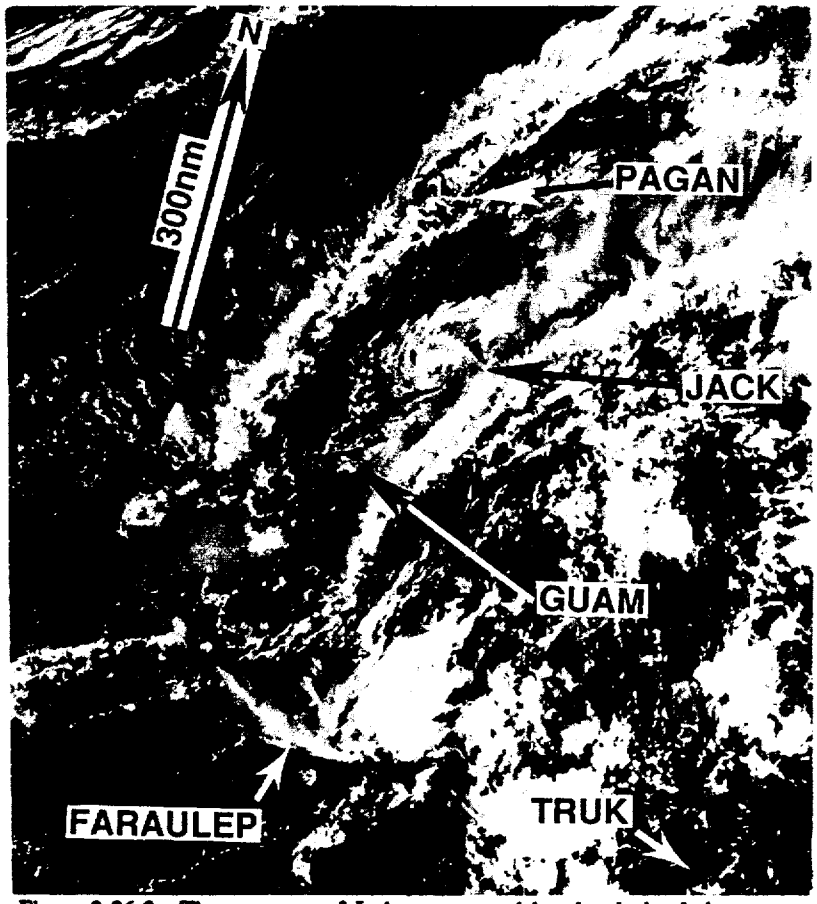

Figure 3-36-3. The remnants of Jack: an exposed low-level circulation center northeast of Guam, and the last vestige of the convection cloud mass to the south (272357Z December DMSP visual imagery).